Complete Summary

TITLE

Pneumonia: median time from arrival at the hospital to the administration of the first dose of antibiotic at the hospital.

SOURCE(S)

Specifications manual for national hospital inpatient quality measures, version 3.0b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct. various p.

Measure Domain

PRIMARY MEASURE DOMAIN

Process

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the Measure Validity page.

SECONDARY MEASURE DOMAIN

Does not apply to this measure

Brief Abstract

DESCRIPTION

This measure* is used to assess the median time from arrival at the hospital to the administration of the first dose of antibiotic at the hospital for patients with pneumonia.

*This is a Joint Commission only measure.

RATIONALE

Time to first antibiotic dose for community-acquired pneumonia (CAP) has recently received significant attention from a quality-of care perspective. This emphasis is based on 2 large retrospective studies of Medicare beneficiaries that demonstrated statistically significantly lower mortality among patients who received early antibiotic therapy. The initial study by Meehan demonstrated a 15% relative reduction in 30-day mortality when antibiotics were administered

within a 8 hours of arrival, whereas the subsequent analysis by Houck et al found that delivery of antibiotics within 4 hours was associated with lower mortality 30-day mortality (15% relative reduction). The studies differed in that Houck and colleagues excluded patients who were on antibiotics prior to hospital arrival. Several small prospective studies that document the time to first antibiotic dose do not consistently demonstrate this reduction in 30-day mortality, although none had as large a patient population as those in the studies of Meehan and Houck. The Infectious Diseases Society of America/American Thoracic Society (IDSA/ATS) guideline committee did recommend that antibiotic therapy should be administered as soon as possible after the diagnosis of pneumonia is considered likely and specifically state that delivery of first antibiotic dose would be expected within 6 to 8 hours of presentation whenever the admission diagnosis is likely CAP.

PRIMARY CLINICAL COMPONENT

Pneumonia; antibiotic timing

DENOMINATOR DESCRIPTION

Patients, 18 years of age and older, with pneumonia (see the related "Denominator Inclusions/Exclusions" field in the Complete Summary)

NUMERATOR DESCRIPTION

Continuous variable statement: The time, in minutes, from hospital arrival to administration of the first dose of antibiotics in the hospital for patients 18 years of age and older with pneumonia

Evidence Supporting the Measure

EVIDENCE SUPPORTING THE CRITERION OF QUALITY

- A clinical practice guideline or other peer-reviewed synthesis of the clinical evidence
- One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

NATIONAL GUIDELINE CLEARINGHOUSE LINK

- Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults.

Evidence Supporting Need for the Measure

NEED FOR THE MEASURE

Use of this measure to improve performance

EVIDENCE SUPPORTING NEED FOR THE MEASURE

Bratzler DW, Houck PM, Nsa W. Initial processes of care and outcomes in elderly patients with pneumonia [abstract]. In: American College of Emergency Physicians Research Forum; October 15, 2001; Chicago (IL).American College of Emergency Physicians; 2001.

Heffelfinger JD, Dowell SF, Jorgensen JH, Klugman KP, Mabry LR, Musher DM, Plouffe JF, Rakowsky A, Schuchat A, Whitney CG. Management of community-acquired pneumonia in the era of pneumococcal resistance: a report from the Drug-Resistant Streptococcus pneumoniae Therapeutic Working Group. Arch Intern Med2000 May 22;160(10):1399-408. PubMed

Houck PM, Bratzler DW, Nsa W, Ma A, Bartlett JG. Timing of antibiotic administration and outcomes for Medicare patients hospitalized with community-acquired pneumonia. Arch Intern Med2004 Mar 22;164(6):637-44. PubMed

Kahn KL, Rogers WH, Rubenstein LV, Sherwood MJ, Reinisch EJ, Keeler EB, Draper D, Kosecoff J, Brook RH. Measuring quality of care with explicit process criteria before and after implementation of the DRG-based prospective payment system. JAMA1990 Oct 17;264(15):1969-73. PubMed

Mandell LA, Wunderink RG, Anzueto A, Bartlett JG, Campbell GD, Dean NC, Dowell SF, File TM Jr, Musher DM, Niederman MS, Torres A, Whitney CG. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis2007 Mar 1;44 Suppl 2:S27-72. [335 references] PubMed

McGarvey RN, Harper JJ. Pneumonia mortality reduction and quality improvement in a community hospital. QRB Qual Rev Bull1993 Apr;19(4):124-30. PubMed

Meehan TP, Fine MJ, Krumholz HM, Scinto JD, Galusha DH, Mockalis JT, Weber GF, Petrillo MK, Houck PM, Fine JM. Quality of care, process, and outcomes in elderly patients with pneumonia. JAMA1997 Dec 17;278(23):2080-4. PubMed

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Accreditation
Collaborative inter-organizational quality improvement
Internal quality improvement

Application of Measure in its Current Use

CARE SETTING

Hospitals

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Measure is not provider specific

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Single Health Care Delivery Organizations

TARGET POPULATION AGE

Age greater than or equal to 18 years

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

In 2004, 60,207 people died of pneumonia. There were an estimated 651,000 hospital discharges in males (44.9 per 10,000) and 717,000 discharges in females (47.7 per 10,000) all attributable to pneumonia in 2005. The highest pneumonia discharge rate that year was seen in those 65 and over at 221.3 per 10,000.

EVIDENCE FOR INCIDENCE/PREVALENCE

National Center for Health Statistics. National hospital discharge survey, 1988, 2004 and 2005 [unpublished].

National Center for Health Statistics. Report of final mortality statistics, 1979-2003. National vital statistics report, preliminary data for 2004. Hyattsville (MD): National Center for Health Statistics;

ASSOCIATION WITH VULNERABLE POPULATIONS

See the "Burden of Illness" field.

BURDEN OF ILLNESS

In the United States (U.S.), pneumonia is the sixth most common cause of death. From 1979-1994, the overall rates of death due to pneumonia and influenza increased by 59%. Much of this increase is due to a greater population of persons aged 65 years or older, and a changing epidemiology of pneumonia, including a

greater proportion of the population with underlying medical conditions at increased risk of respiratory infection.

See also the "Incidence/Prevalence" field.

EVIDENCE FOR BURDEN OF ILLNESS

Bartlett JG, Dowell SF, Mandell LA, File Jr TM, Musher DM, Fine MJ. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. Clin Infect Dis2000 Aug;31(2):347-82. [218 references] PubMed

UTILIZATION

Annually, 2-3 million cases of community-acquired pneumonia result in 10 million physician visits, 500,000 hospitalizations, and 45,000 deaths.

See also the "Incidence/Prevalence" field.

EVIDENCE FOR UTILIZATION

Bartlett JG, Dowell SF, Mandell LA, File Jr TM, Musher DM, Fine MJ. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. Clin Infect Dis2000 Aug;31(2):347-82. [218 references] PubMed

COSTS

Unspecified

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Timeliness

Data Collection for the Measure

CASE FINDING

Users of care only

DESCRIPTION OF CASE FINDING

Discharges, 18 years of age and older, with a principal diagnosis of pneumonia *or* a principal diagnosis of septicemia or respiratory failure (acute or chronic) *and* other diagnosis code of pneumonia

DENOMINATOR SAMPLING FRAME

Patients associated with provider

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions

Discharges, 18 years of age and older, with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Principal Diagnosis Code of pneumonia as defined in the appendices of the original measure documentation *or* ICD-9-CM Principal Diagnosis Code of septicemia or respiratory failure (acute or chronic) as defined in the appendices, of the original measure documentation *and* an ICD-9-CM Other Diagnosis Code of pneumonia as defined in the appendices of the original measure documentation

Exclusions

- Patients less than 18 years of age
- Patients who have a Length of Stay (LOS) greater than 120 days
- Patients with Cystic Fibrosis (as defined in the appendices of the original measure documentation)
- Patients who had no chest x-ray or computed tomography (CT) scan that indicated abnormal findings within 24 hours prior to hospital arrival or anytime during this hospitalization
- Patients with *Comfort Measures Only* documented on day of or day after arrival
- Patients enrolled in clinical trials
- Patients received as a transfer from the emergency department (ED) of another hospital
- Patients received as a transfer from an acute care facility where they were an inpatient or outpatient
- Patients received as a transfer from one distinct unit of the hospital to another distinct unit of the same hospital
- Patients received as a transfer from an ambulatory surgery center
- Patients who had no diagnosis of pneumonia either as the ED final diagnosis/impression or direct admission diagnosis/impression
- Patients with *Diagnostic Uncertainty* as defined in the Data Dictionary
- Patients discharges/transferred to another hospital for inpatient care on day of or day after arrival
- Patients who left against medical advice or discontinued care on day of or day after arrival
- Patients who expired on day of or day after arrival
- Patients discharged/transferred to a federal health care facility on day of or day after arrival
- Patients who do not receive any antibiotics within 24 hours after arrival or who received antibiotics the day of arrival (prior to arrival to the hospital) or the day prior to arrival

RELATIONSHIP OF DENOMINATOR TO NUMERATOR

All cases in the denominator are equally eligible to appear in the numerator

DENOMINATOR (INDEX) EVENT

Clinical Condition
Institutionalization

DENOMINATOR TIME WINDOW

Time window brackets index event

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions
Continuous variable statement: The time, in minutes, from hospital arrival to administration of the first dose of antibiotics in the hospital for patients 18 years of age and older with pneumonia

Exclusions
None

MEASURE RESULTS UNDER CONTROL OF HEALTH CARE PROFESSIONALS, ORGANIZATIONS AND/OR POLICYMAKERS

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

NUMERATOR TIME WINDOW

Fixed time period

DATA SOURCE

Administrative data
Medical record

LEVEL OF DETERMINATION OF QUALITY

Not Individual Case

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Continuous Variable

INTERPRETATION OF SCORE

Better quality is associated with a lower score

ALLOWANCE FOR PATIENT FACTORS

Unspecified

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends
Internal time comparison

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

The core measure pilot project was a collaboration among The Joint Commission, five state hospitals associations, five measurement systems, and 83 hospitals from across nine states. Participating hospitals collected and reported data for community acquired pneumonia (CAP) measures from March 2001 to December 2001.

Core measure reliability visits were completed the summer of 2001 at a random sample of 16 participating hospitals across 6 states.

Preliminary data from the pilot test show an average median rate of 194.04 minutes (3.2 hours).

EVIDENCE FOR RELIABILITY/VALIDITY TESTING

The Joint Commission. A comprehensive review of development and testing for national implementation of hospital core measures. Oakbrook Terrace (IL): The Joint Commission; 40 p.

Identifying Information

ORIGINAL TITLE

PN-5: antibiotic timing (median).

MEASURE COLLECTION

National Hospital Inpatient Quality Measures

MEASURE SET NAME

Pneumonia

SUBMITTER

Centers for Medicare & Medicaid Services
Joint Commission, The

DEVELOPER

Centers for Medicare & Medicaid Services/The Joint Commission

FUNDING SOURCE(S)

All external funding for measure development has been received and used in full compliance with The Joint Commission's Corporate Sponsorship policies, which are available upon written request to The Joint Commission.

COMPOSITION OF THE GROUP THAT DEVELOPED THE MEASURE

The measure was developed and continues to be maintained in conjunction with a multi-disciplinary Technical Expert Panel.

FINANCIAL DISCLOSURES/OTHER POTENTIAL CONFLICTS OF INTEREST

Expert panel members have made full disclosure of relevant financial and conflict of interest information in accordance with the Joint Commission's Conflict of Interest policies, copies of which are available upon written request to The Joint Commission.

ADAPTATION

Measure was not adapted from another source.

RELEASE DATE

2000 Aug

REVISION DATE

2009 Oct

MEASURE STATUS

This is the current release of the measure.

This measure updates a previous version: Specifications manual for national hospital quality measures, version 2.5b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2008 Oct. various p.

SOURCE(S)

Specifications manual for national hospital inpatient quality measures, version 3.0b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct. various p.

MEASURE AVAILABILITY

The individual measure, "PN-5: Antibiotic Timing (Median)," is published in "Specifications Manual for National Hospital Inpatient Quality Measures." This document is available from The Joint Commission Web site. Information is also available from the Centers for Medicare & Medicaid Services (CMS) Web site. Check The Joint Commission Web site and CMS Web site regularly for the most recent version of the specifications manual and for the applicable dates of discharge.

COMPANION DOCUMENTS

The following are available:

- A software application designed for the collection and analysis of quality improvement data, the CMS Abstraction and Reporting Tool (CART), is available from the CMS CART Web site. Supporting documentation is also available. For more information, e-mail CMS PROINQUIRIES at proinquiries@cms.hhs.gov.
- The Joint Commission. A comprehensive review of development and testing for national implementation of hospital core measures. Oakbrook Terrace (IL): The Joint Commission; 40 p. This document is available from The Joint Commission Web site.
- The Joint Commission. Attributes of core performance measures and associated evaluation criteria. Oakbrook Terrace (IL): The Joint Commission; 5 p. This document is available from The Joint Commission Web site.

NQMC STATUS

This NQMC summary was originally completed by ECRI on February 7, 2003. This NQMC summary was updated by ECRI Institute on October 11, 2005, April 10, 2007, and on October 26, 2007. The Joint Commission informed NQMC that this measure was updated on August 29, 2008 and provided an updated version of the NQMC summary. This NQMC summary was updated accordingly by ECRI Institute on November 11, 2008. The information was verified by the Centers for Medicare & Medicaid Services on January 22, 2009. The Joint Commission informed NQMC that this measure was updated again on October 1, 2009 and provided an updated version of the NQMC summary. This NQMC summary was updated accordingly by ECRI Institute on December 2, 2009.

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